

This Page Is Inserted by IFW Operations
and is not a part of the Official Record

BEST AVAILABLE IMAGES

Defective images within this document are accurate representations of the original documents submitted by the applicant.

Defects in the images may include (but are not limited to):

- BLACK BORDERS
- TEXT CUT OFF AT TOP, BOTTOM OR SIDES
- FADED TEXT
- ILLEGIBLE TEXT
- SKEWED/SLANTED IMAGES
- COLORED PHOTOS
- BLACK OR VERY BLACK AND WHITE DARK PHOTOS
- GRAY SCALE DOCUMENTS

IMAGES ARE BEST AVAILABLE COPY.

**As rescanning documents *will not* correct images,
please do not report the images to the
Image Problem Mailbox.**

SUPPORT FOR THE AMENDMENT

The amendment to Claims 1 and 6-7 and newly added Claims 14-17 are supported in the original claims. No new matter is believed to be introduced by the above amendment.

REMARKS

Claims 1, 6-7, and 14-17 are pending. Favorable reconsideration is respectfully requested.

At the outset, Applicants thank Examiner Yamnitzky for the courteous discussion held on July 10, 2002, and for helpful suggestions within the outstanding Office Action and during the above-mentioned discussion to overcome the rejections therein.

The rejections of Claims 1-2, 4-7, and 9-13 under 35 U.S.C. § 102(b) and/or § 103(a) over Suzuki et al are believed to be obviated by the amendment above. Further, the active claims are neither anticipated nor suggested by Suzuki et al in light of the following remarks and the information provided in the attached 132 Declaration.

In accordance with the Examiner's suggestion during the discussion of July 10, 2002, Applicants have amended Claim 1 to include the specific embodiments of Claim 4 and structures (r4)-(r17) and (r20)-(r22) of Claim 5. During the discussion, the Examiner indicated that the above amendment to Claim 1 would overcome the rejection based on Suzuki et al because the reference fails to disclose or suggest such compounds. Accordingly, withdrawal of this ground of rejection is respectfully requested.

In addition, Applicants have amended Claim 7 in order to specify the embodiments of Claim 13, except for structure (a12).

Suzuki et al disclose adamantane compounds having the formula set forth in original Claim 7 where all of the R1-R8 substituents are hydrogen. The Examiner recognizes that these compounds do not contain any other substituent other than hydrogen as R1-R8.

In direct contrast, Claim 7 has been amended in order to specify the compounds of formula (a1)-(a11) and (a13) which are recited in original Claim 13. The Examiner has recognized that Suzuki et al fail to disclose adamantane derivative structures represented by the chemical formulae (a7)-(a11) and (a13). Further, Applicants respectfully submit that adamantane derivatives represented the chemical formulae (a1)-(a6) are also not obvious in light of the results of the comparative experiments presented in the 132 Declaration submitted herewith.

As discussed at paragraphs 7-9 in the Declaration, the thermal tolerance of a compound that contains an adamantyl radical and nitrogen at the para position of phenylen depends on the kinetics of the aromatic tertiary amine portion of the compound. Further, the aromatic tertiary amine portion has superior kinetics to a rigid adamantyl radical. The only degrees of freedom of kinetics for the aromatic tertiary amine compound is the rotation of the bond between the nitrogen and the aromatic ring (p), as well as the rotation of the bond between the adamantane and the phenylen radical (q). Therefore, a higher energy barrier of the resultant compound will possess superior thermotolerance.

An inventor of the present application conducted comparative studies on 10 different compounds (See Tables 1 and 2 of the Declaration). Nine of these compounds are representations of the inventive compounds because they possess at least one substituent other than hydrogen, while one of the compounds is representative of an adamantane derivative as described by Suzuki et al because it does not possess any substituents other than

hydrogen. The inventor calculated the energy barrier for each of the above-mentioned rotational degrees of freedom for each of the 10 adamantane derivatives.

The rotational energy barrier for the bond between the nitrogen and the aromatic ring (p) within the adamantyl derivative according to Suzuki et al is 22.8 kcal/mol, while that of the adamantane derivatives presently claimed range from 52.4 to 934.3 kcal/mol (see Table 1 of the Declaration). Therefore, the claimed adamantyl derivatives possess a rotational energy barrier that is from 2 to 41 times greater than that of the adamantyl derivative according to Suzuki et al. Further, the adamantyl derivative according to Suzuki et al has an energy rotational barrier for the bond between the adamantane and the phenylen radical (q) of 253.4 kcal/mol, while that of an adamantyl derivative presently claimed is 1,606.1 kcal/mol (see Table 1 of the Declaration). Therefore, the claimed adamantyl derivatives possess a rotational energy barrier that is more than 6 times greater than that of the adamantyl derivative according to Suzuki et al.

As explained at paragraphs 7-9 in the attached Declaration, the steric energy barrier of the rotational bond is much higher in an organic compound layer containing compounds (a1)-(a6). Accordingly, it is predicted that the claimed adamantyl derivatives possess a considerable enhancement in their thermotolerance when compared to the adamantane derivatives according to Suzuki et al. Since Suzuki et al fail to provide a disclosure that suggests, with sufficient specificity, the claimed adamantyl derivatives and the attached Declaration provides data demonstrating the superior increase in the rotational energy barriers within the claimed adamantane derivatives, as well as the superior thermal tolerance of such derivatives, Applicants respectfully submit that the presently claimed adamantane derivatives

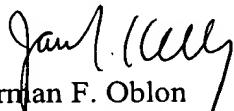
are not obvious with regard to the disclosure of Suzuki et al. Accordingly, withdrawal of this ground of rejection is respectfully requested.

The rejection of Claims 1-13 under 35 U.S.C. § 112, second paragraph, is believed to be obviated by the amendment above. The amendment submitted above cancels many of the claims which contain recitations that the Examiner deemed "indefinite." Further, Applicants have amended the remaining claims for clarity and to recite the claimed invention in a manner suggested by the Examiner at pages 4-9 of the outstanding Office Action. Accordingly, withdrawal of this ground of rejection is respectfully requested.

Applicants respectfully submit that the present application is now in condition for allowance. Favorable reconsideration is respectfully requested.

Respectfully submitted,

OBLON, SPIVAK, McCLELLAND,
MAIER & NEUSTADT, P.C.


Norman F. Oblon
Attorney of Record
Registration No. 24,618

James J. Kelly, Ph.D.
Registration No. 41,504



22850

(703) 413-3000
Fax #: (703) 413-2220
NFO/JK/TWB/cja

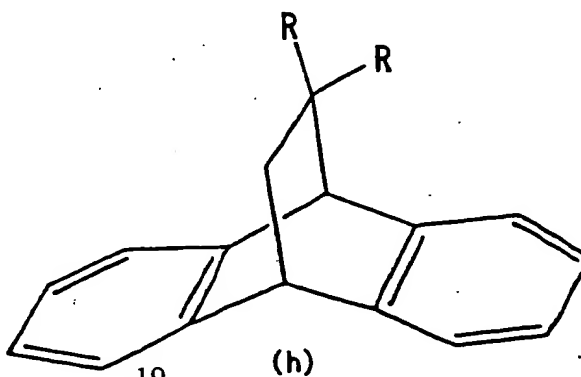
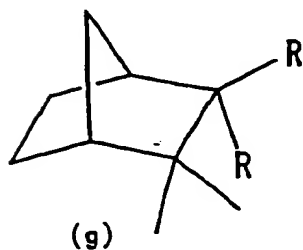
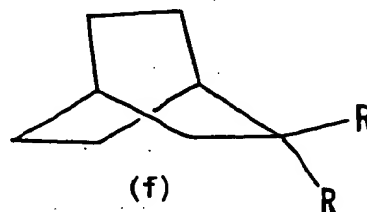
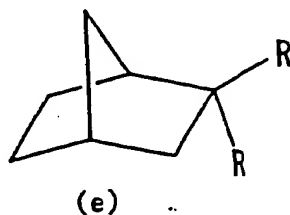
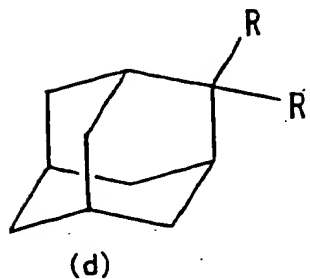
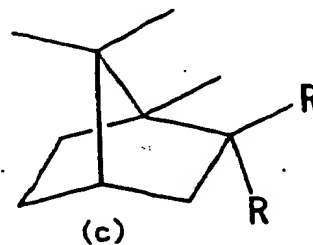
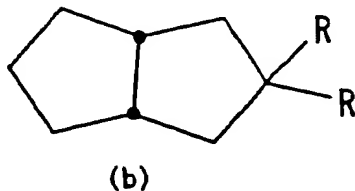
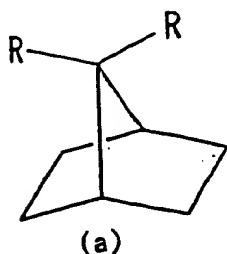
I:\atty\Twb\195463US-am.wpd

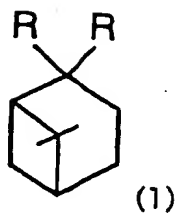
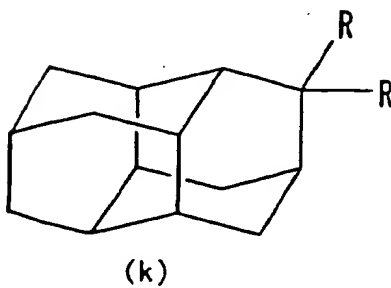
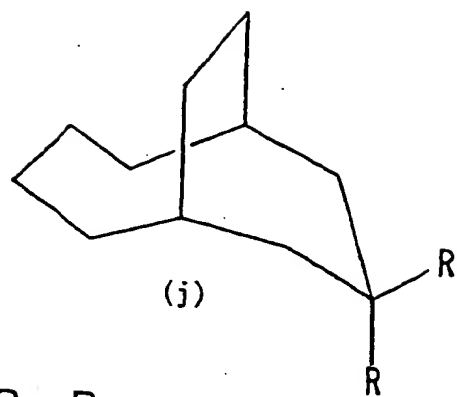
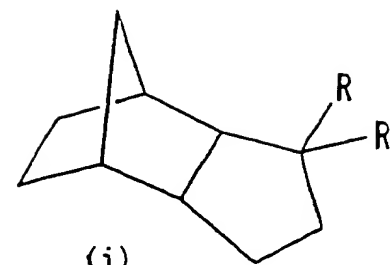
Marked-Up Copy
Serial No:09/632,348
Amendment Filed on:
HEREWITH

IN THE CLAIMS

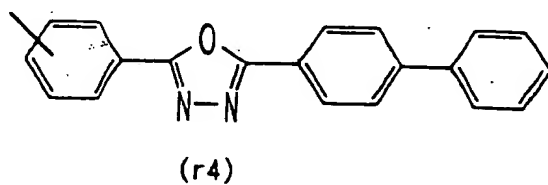
Please amend the claims as follows:

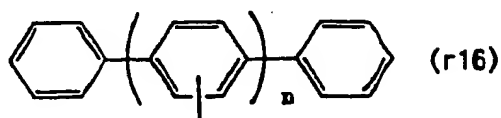
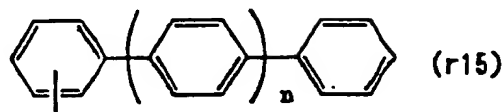
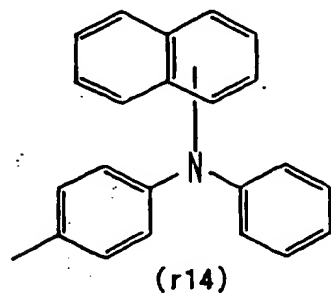
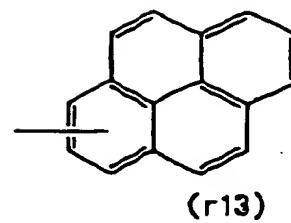
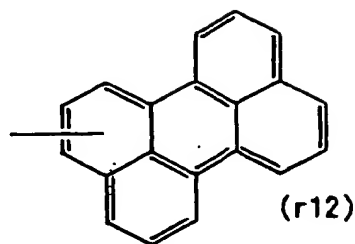
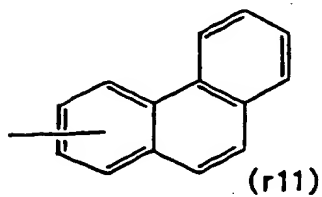
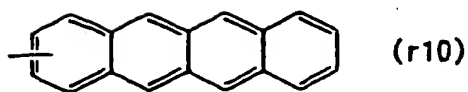
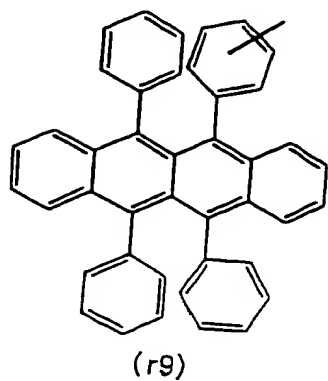
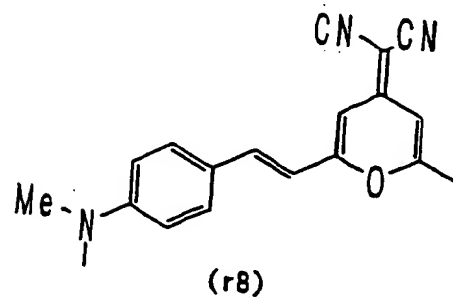
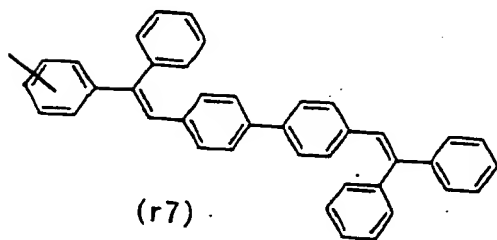
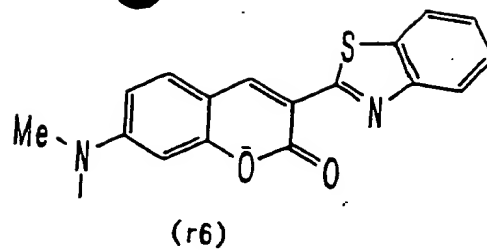
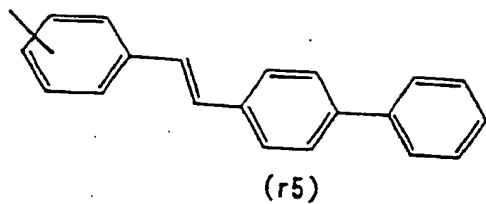
--1. (Amended) An electro luminescent element comprising at least one organic compound layer between electrodes, wherein the at least one said organic compound layer is a condensed ring compound derivative represented by one of the following chemical formulae (a) to (1):

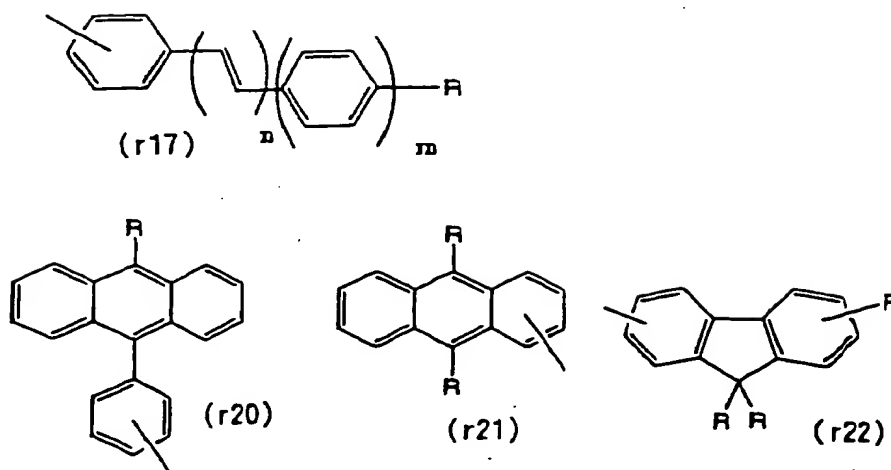




wherein R represents a functional unit represented by one of the following chemical formulae, (r4) to (r17) or (r20) to (r22):







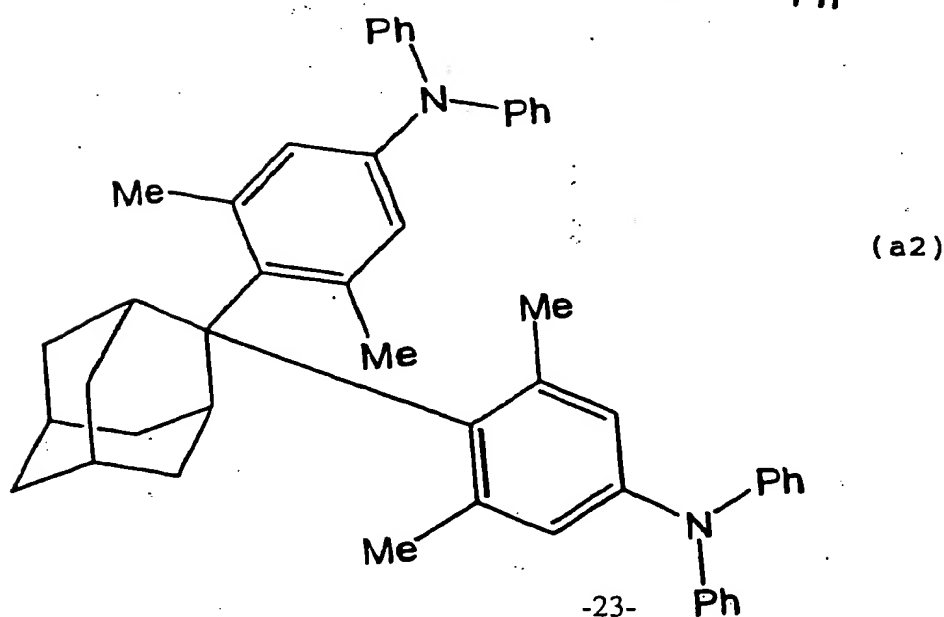
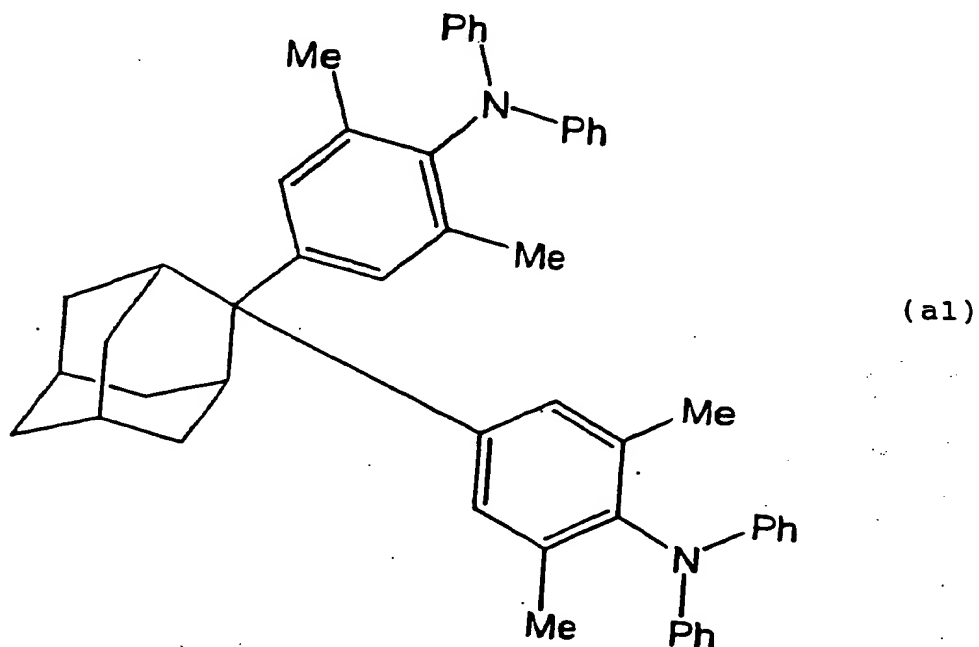
wherein n and m represent positive integers, R represents saturated hydrocarbon from C1 through C30 or an aromatic compound.

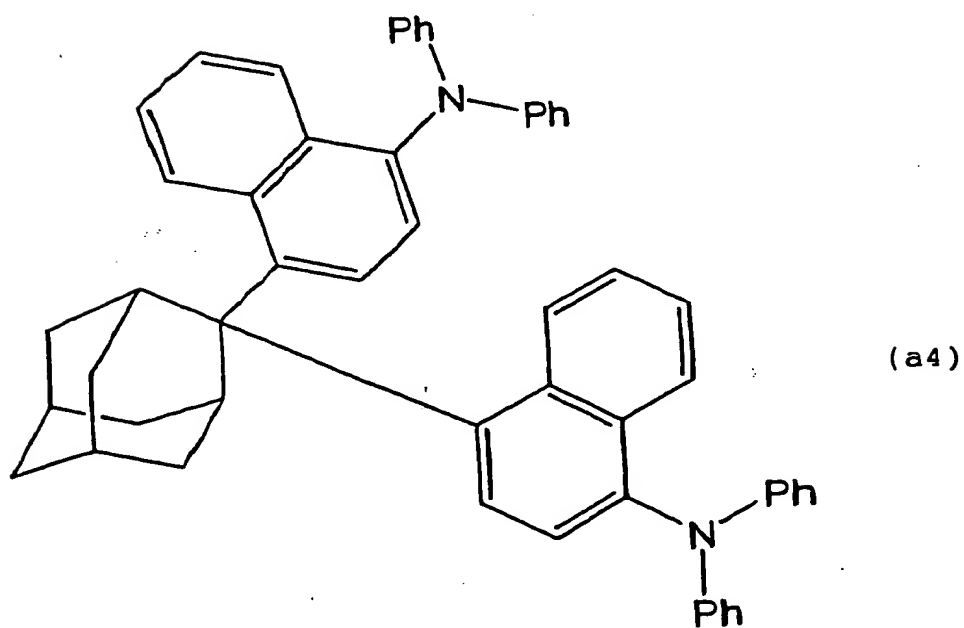
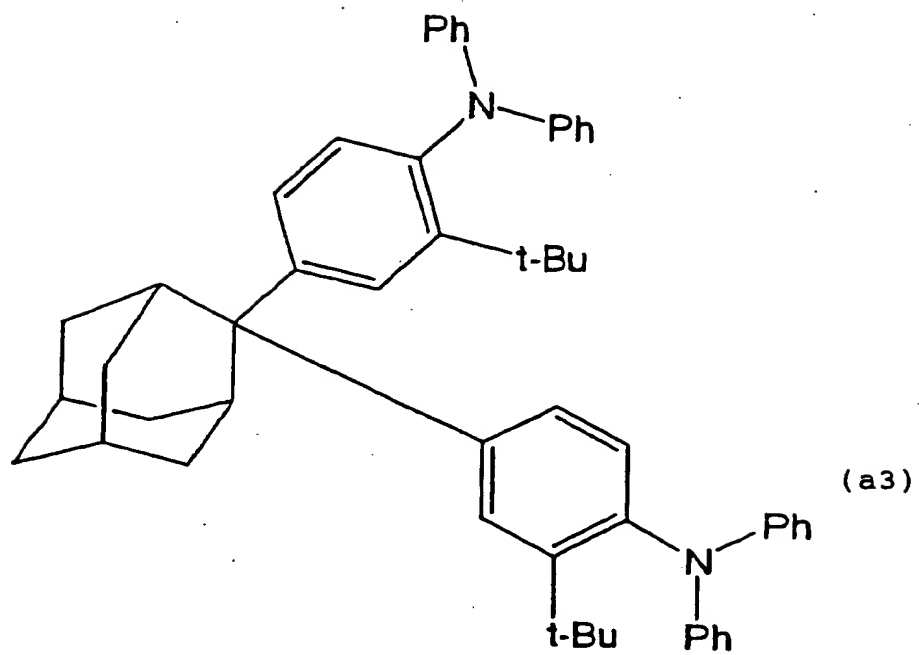
6. (Amended) An electro luminescent element according to claim [5] 1, wherein [said aromatic compound,] R of the condensed ring compound derivative is an aromatic compound selected from the group consisting of phenyl, naphthyl, indenyl, fluorenyl, phenanthryl, anthranyl, pyrenyl, chrysenyl, naphthacenyl, benzophenanthrenyl, furanyl, thiophenyl, pyrrolyl, oxazolyl, isoxazolyl, pyrazolyl, triazolyl, furazalyl, pyridyl, oxazol, morpholyl, thiazyl, pyridazyl, pyrimidyl, pyrazyl, triazyl, benzofuryl, isobenzofuryl, benzothiophenyl, indolyl, isoindolyl, benzoxazolyl, benzothiazolyl, benzoimidazolyl, chromeryl, quinolyl, isoquinolyl, cinnolyl, phthalazyl, quinazolyl, quinoxalyl, dibenzofuril, carbazolyl, xanthenyl, acridinyl, phenanthridinyl, phenanthryl, phenaziny, phenoxazinyl, thianthrenyl, indoliziny, quinoliziny, naphthyridinyl, purinyl, puritedinyl, oxadiazolyl, oxathiazolyl, and combinations thereof.

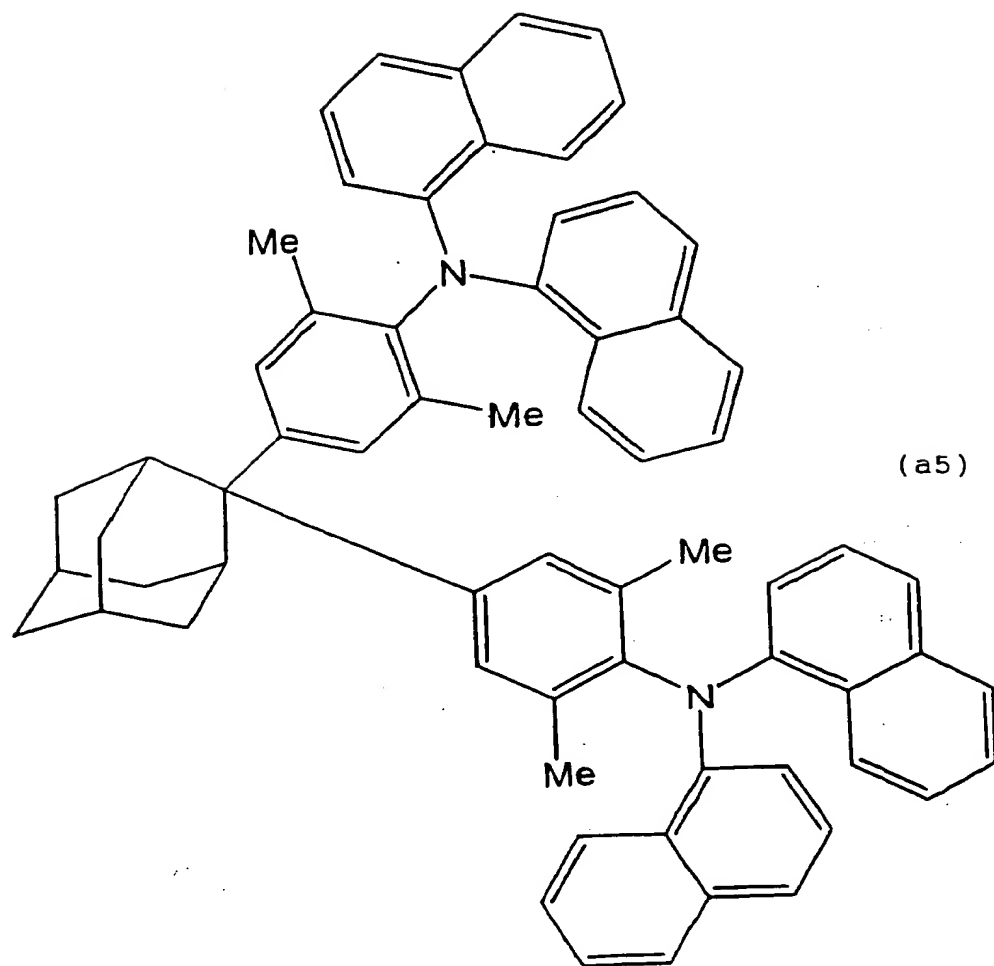
wherein the aromatic compound is bonded via $>C=C<$, $>C=N-$, $-N=N-$, $-N(R)-$, $-O-$, $-S-$, $-SO-$, $-SO_2-$, $-Si(R_2)-$, $>C=Si<$, $-C\equiv C-$, [and] or $-B(R)-$.

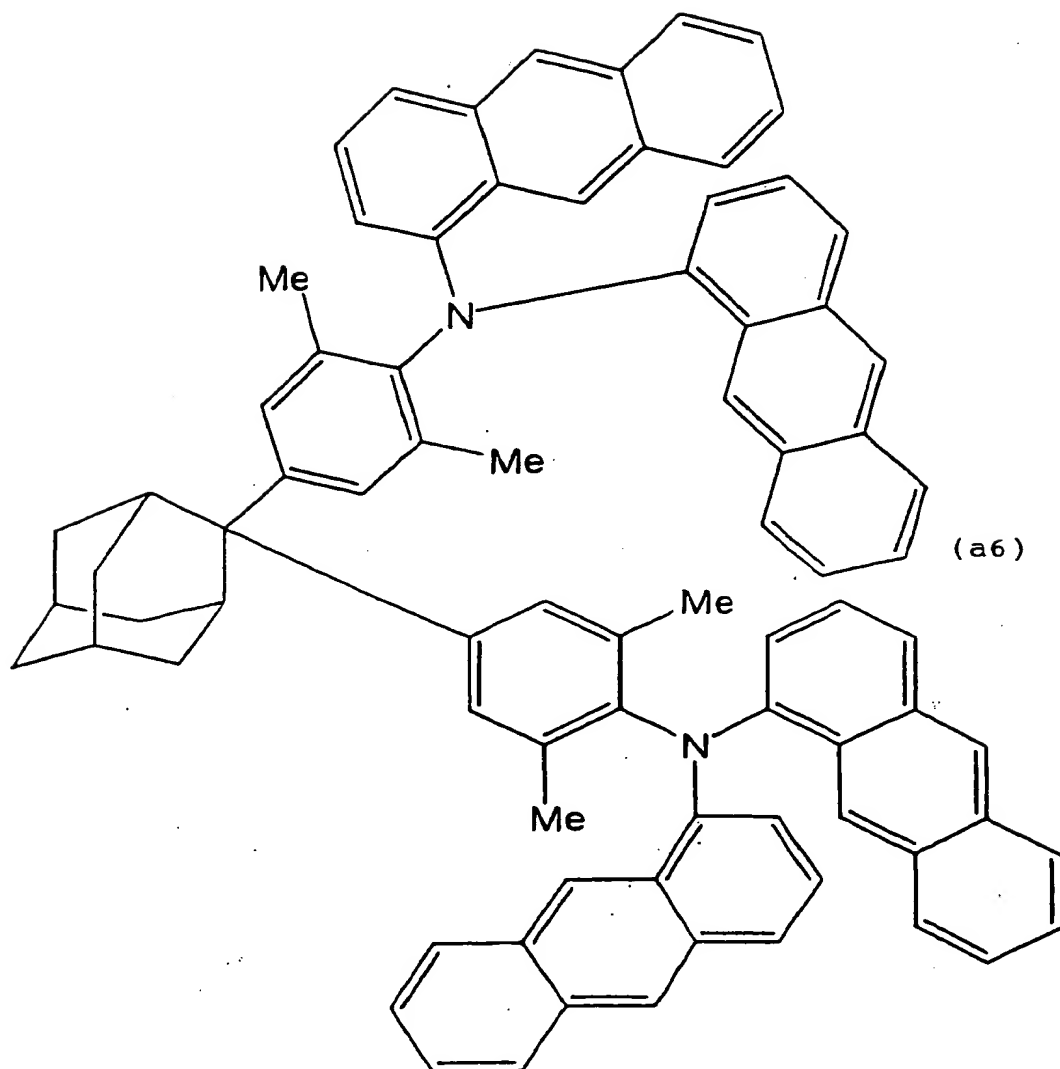
7. (Amended) An electro luminescent element comprising at least one organic compound layer between electrodes, wherein,

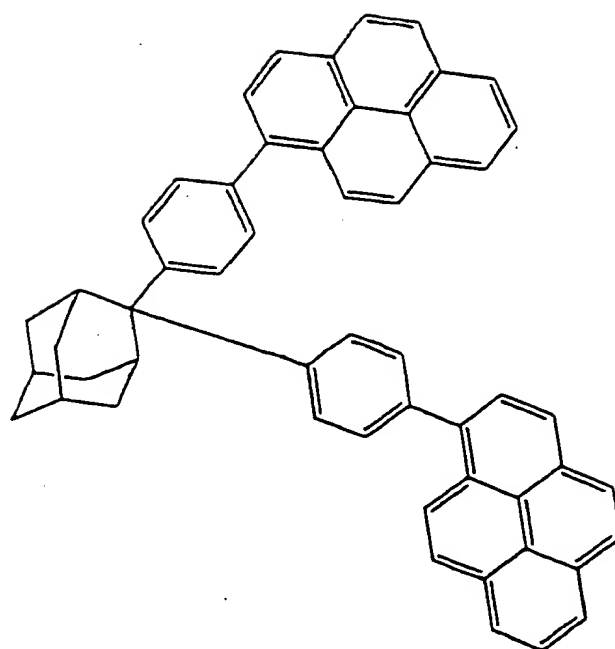
at least one said organic compound layer is an adamantane derivative represented by [the chemical formula] one of the following chemical formulae (a1) to (a11) or (a13):



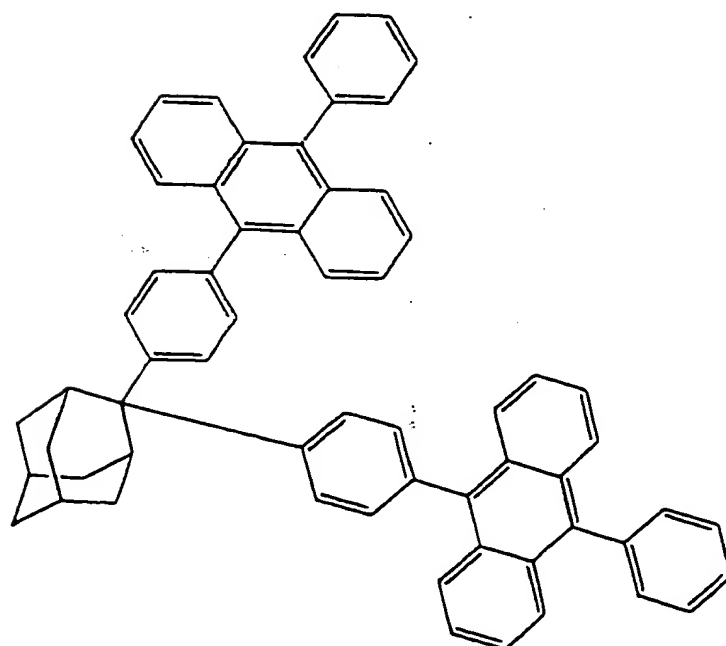




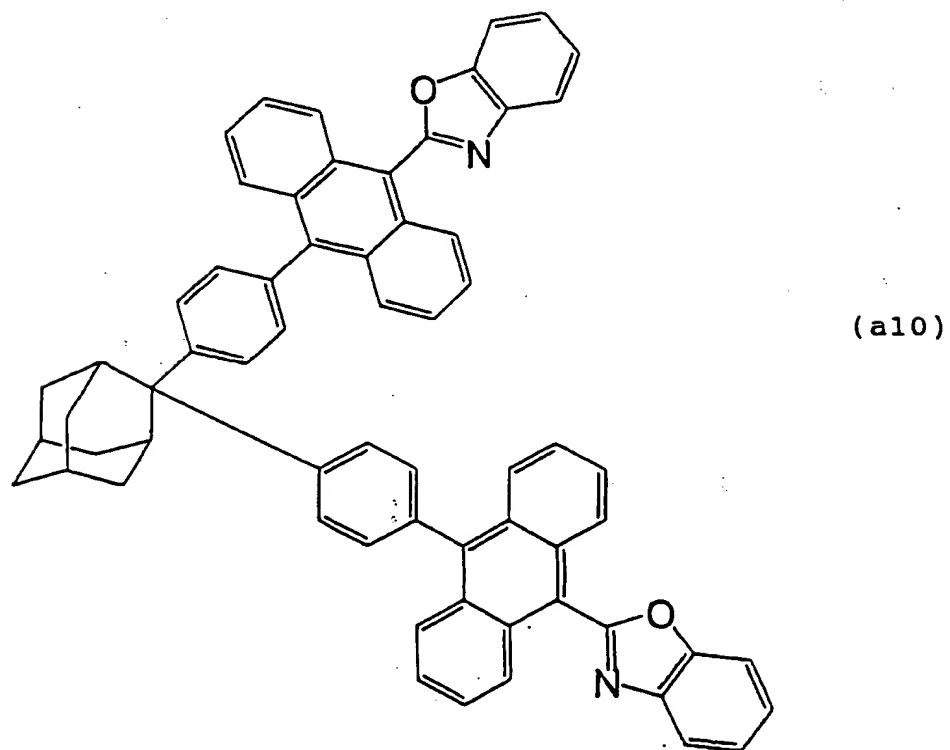
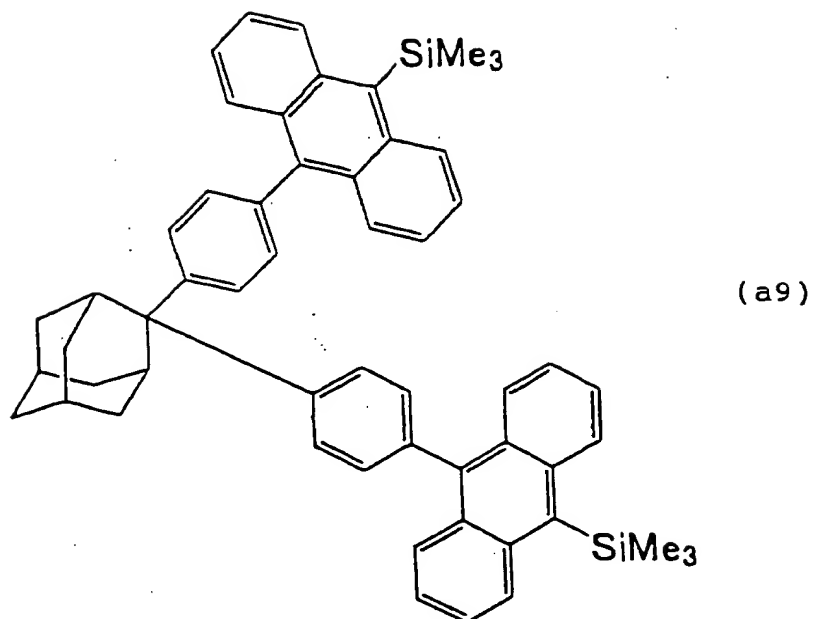


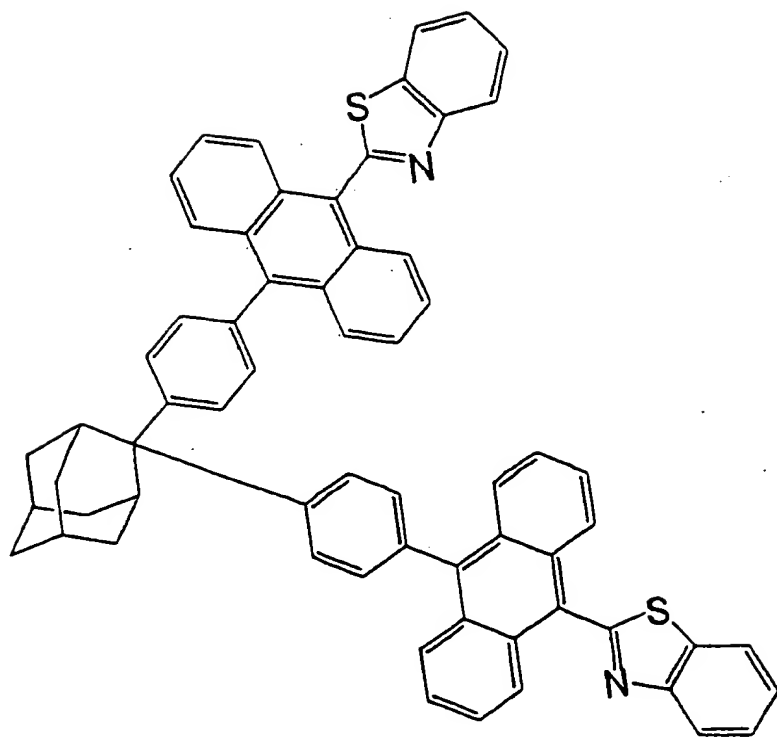


(a7)

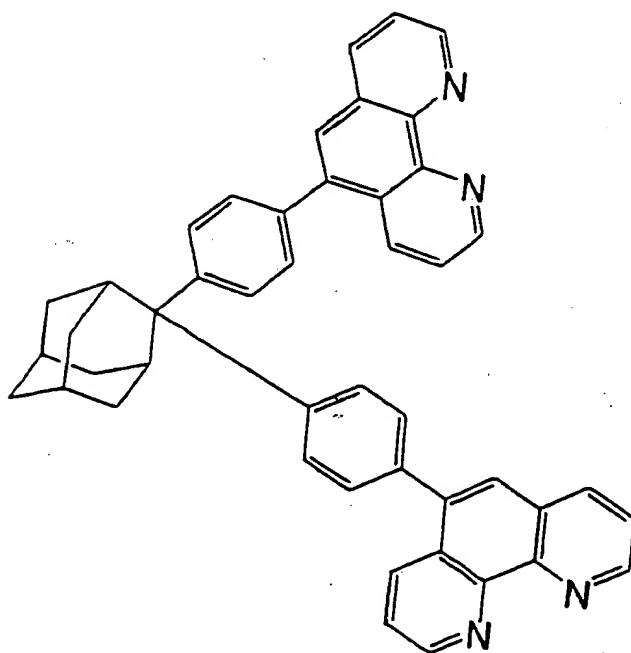


(a8)





(a11)



(a13)

--Claims 2-5 and 8-13 are cancelled.--

--Claims 14-17 are new.--